



# NOAA 'Bout Weather



Written by the staff at the National Weather Service in Blacksburg, VA

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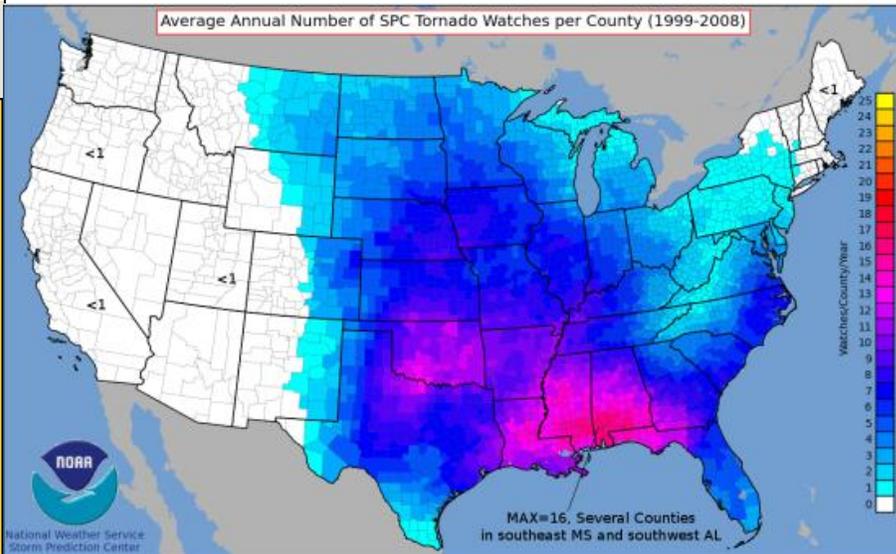
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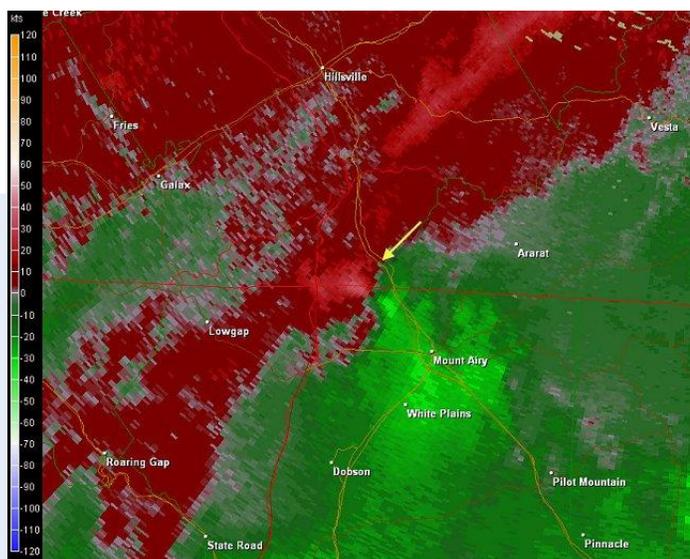
## Winter Preparedness Tips

By Phil Hysell (Warning Coordination Meteorologist)

Each year, dozens of Americans die due to exposure to cold. Add to that number, vehicle accidents and fatalities, fires due to dangerous use of heaters and other winter weather fatalities, and you have a significant threat. A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snow and cold temperatures. People can become trapped at home or in a car, without utilities or other assistance. The aftermath of a winter storm can have an impact on a community or region for days, weeks or even months.

The National Weather Service would like you to prepare you and your family for this potentially life-threatening hazard. Preparation tips are located throughout the newsletter!

For more information about winter weather preparedness visit: <http://www.nws.noaa.gov/om/winter/index.shtml>



Top: Average Annual number of tornado watches issued by the Storm Prediction Center. You can see the impact of the Appalachian Mountains, with a minimum of around 1 per year. However, as we recently have seen, tornadoes still can and do happen in our mountain counties.

Bottom : Radar velocity image showing rotation at the time of a tornado near Cana, VA



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## THE "GREAT APPALACHIAN STORM" OF 1950

By Anita Silverman (Lead Forecaster)

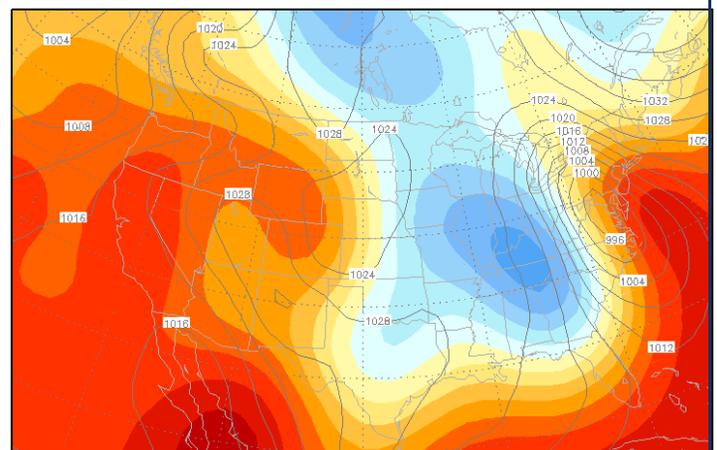
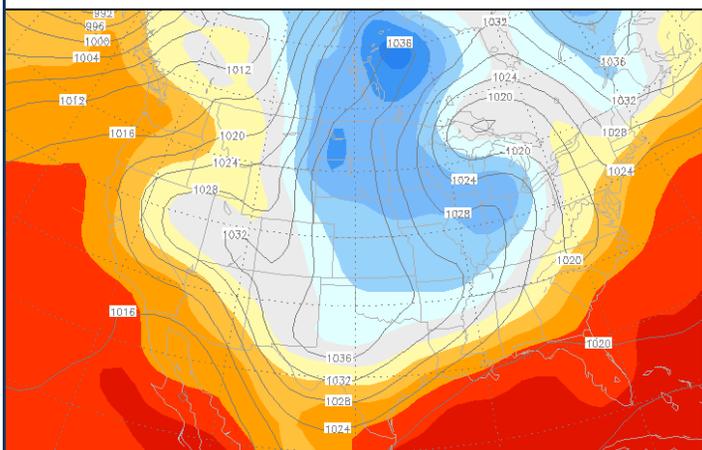
Ranked near the top of most lists for worst storms over the United States would be the storm of November 25-27, 1950 (Smith, 1950, Bristol, 1951). The storm Thanksgiving weekend caused East Coast flooding, widespread wind damage, and record snowfalls and minimum temperatures. In the years following the storm, it served as a case study by the pioneers in numerical weather prediction (e.g. Phillips, 1958)

### *The Weather Pattern*

The initial conditions depict a weak cyclonic wave over Minnesota, along the leading edge of a very cold air mass over southwestern Canada. Over the course of the next 5 days, the record breaking cold air moved southeastward, eventually spawning a coastal "bomb" that retrograded back to the lower Great Lakes underneath a deep closed upper low. The associated arctic cold front crossed the eastern United States on November 24th.

Low pressure quickly developed on the arctic front over North Carolina on the 25<sup>th</sup> which then deepened rapidly over southern Virginia. Meanwhile, strong high pressure was over eastern Canada with readings of 1049 millibars, or near 31 inches. The low proceeded to move north and northwest into western Pennsylvania and northeastern Ohio.

By midday on November 26<sup>th</sup> a shield of heavy snow expanded back to the northwest along with the low. The storm slowly wound down as it spun in place over Lake Erie on the 27<sup>th</sup> and 28<sup>th</sup> before it finally weakened and exited into Canada on the 29<sup>th</sup> and 30<sup>th</sup>.



Mean Sea Level Pressure in millibars (solid lines) and temperatures in Deg. F (color fill). 7am November 24, 1950 on the left, 7am November 25<sup>th</sup> on the right



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## The Cold

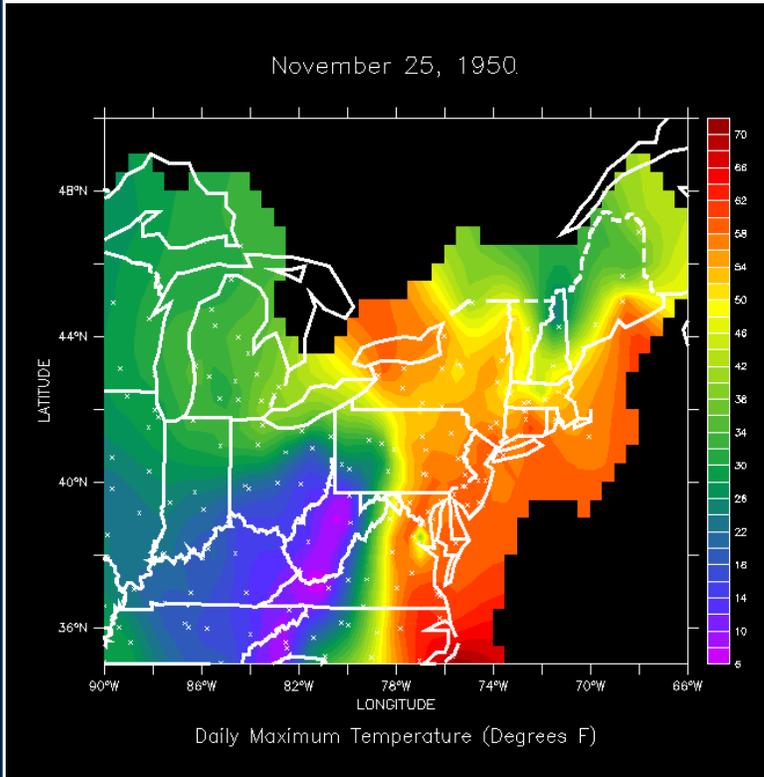
An unseasonably cold arctic airmass surged in behind the front across the Upper Midwest and Ohio Valley with most locations recording temperatures in the single digits to below zero on the 24<sup>th</sup> through 26<sup>th</sup>. Many states recorded all time record lows for November. The extreme cold even advanced into the Deep South. States like Georgia, Tennessee, Florida and Louisiana also set records.

Locations reporting their coldest November temperature on record included, but were not limited to:

City	State	Temperature (F)	City	State	Temperature (F)
Mount Mitchell	NC	-26	St. Louis	MO	4
Neillsville	WI	-16	Elkins	WV	4
Houghton Lake	MI	-14	Columbia	MO	5
Muskegon	MI	-14	Bristol	TN	5
Grand Rapids	MI	-10	Chareston	WV	6
Madison	WI	-8	Pittsburgh	PA	7
South Bend	IN	-7	Huntington	WV	7
Bowling Green	KY	-7	Tupelo	MS	8
Homer's Gap	PA	-6	Charleston	SC	15
Asheville	NC	-5	Raleigh	NC	16
Rockford	IL	-4	Wilmington	NC	16
Valley Head	AL	-2	Fort Smith	AR	17
Chicago	IL	-2	Tulsa	OK	17
Indianapolis	IN	-2	Richmond	VA	18
Louisville	KY	-1	Wichita	KS	19
Nashville	TN	-1	Washington	DC	21
Waterloo	IA	0	Pensacola	FL	22
Cincinnati	OH	0	Norfolk	VA	22
Huntsville	AL	1	Shreveport	LA	23
Beckley	WV	1	San Angelo	TX	23
Atlanta	GA	3	Houston	TX	29
Dayton	OH	3	Tampa	FL	36



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Within the Blacksburg County warning area temperatures also changed dramatically dropping from maximum temperatures in the lower 50s to lower 60s on November 24<sup>th</sup> to minimum temperatures in the single digits and teens on the 25<sup>th</sup> and 26<sup>th</sup>. A few locations even had temperatures below zero. The following table shows the coldest temperatures recorded during the storm.

Location	Low (F)	Location	Low (F)
Blowing Rock 1NW, NC	-7	Glen Lyn, VA	6
Flat Top, WV	-4	Alderson, WV	6
Burkes Garden, VA	-3	Bedford, VA	8
Floyd 2NE, VA	-2	Stuart, VA	8
Transou, NC	-1	Bluestone Lake, WV	8
Union 3SSE, WV	1	Roanoke, VA	9
Wytheville 1S, VA	2	Buchanan, VA	9
Hot Springs, VA	3	Lynchburg, VA	11
Mount Airy 2W, NC	3	Lexington, VA	11
Elkins, WV	4	Chatham, VA	12
Saltville 1N, VA	4	Charlotte Court House, VA	14
White Sulphur Springs, WV	4	Danville, VA	15



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## Winter Weather Flying Tips

By Ken Kostura (General Forecaster)

Winter weather can adversely affect flight operations with poor weather conditions because of fast moving fronts, strong and gusty winds, blowing and drifting of snow and icing conditions. Pilots operating during the winter should follow special winter operating procedures. Local pilots can refer to the [aviation portion of the Area Forecast Discussion](#) for some additional insights on the aviation TAF forecasts. The Blacksburg National Weather Service Forecast Office writes TAF's for the Roanoke ([ROA](#)), Lynchburg ([LYH](#)), Danville ([DAN](#)), and Blacksburg ([BCB](#)) in Virginia, and Bluefield ([BLF](#)) and Lewisburg ([LWB](#)) in West Virginia. The BCB TAF for the Virginia Tech/Montgomery Executive Airport started on Wednesday, March 23, 2011.



During the winter, the environment can change dramatically just a few miles away from local conditions. For example, in a northwest upslope snow event, several inches of snow could be falling in western Greenbrier County, while snow flurries are occurring at the Lewisburg (LWB) Airport. Another great source for aviation weather information before your flight is the [Aviation Weather Center](#).

File a flight plan as recommend by FAA. A flight plan, combined with an ELT and some knowledge on winter survival may save your life. Just like with your car or house, general aviation pilots need to prepare for the winter. Installation of winter baffles, removal of wheel pants, grade of oil, condition of batteries, and tension of control cable are some items to review before the cold temperatures of winter cause difficulties.

The route of the flight and preflight checklist are two important considerations. A thorough preflight inspection is critical in temperature extremes. Fuel contamination is a possibility in cold climates. Follow the [FAA regulations](#) and your airplane manufacturer which contain excellent information on fuel contamination. Preheat is a good idea, not only for the engine, but also for the cockpit. Low temperatures can change the viscosity of engine oil, batteries can lose effectiveness, and instruments, knobs and warning lights can stick.

Make sure you follow all safety precautions in the preheat process to avoid a fire.

A good time to turn on your radio and tuner to the desired frequency is after the aircraft electrical power is stabilized after warming up for a few minutes. The FAA recommends that all frost, snow and ice be removed before attempting flight. If you cannot blow it off yourself, don't count on the takeoff roll to do it for you. If your plane is parked in an area of blowing snow, special attention should be given to locations where snow can enter, freeze solid and obstruct operation. For example, openings like the pitot tubes, heater and carburetor intakes should be free of snow and ice. Read and follow the manufacturer's suggestions for winter weather flying.

Taxing, takeoff and landings can be quite a challenge because braking action on ice and snow is generally poor. Cold weather can cause "below sea level" density altitudes. Pilots should be aware of engine power, particularly with turbo or supercharge engines with the potential to overboost the engine. During climb-out, be aware of cylinder head



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temperatures by watching closely the head temperature gauges. Because of winter baffling, you may need to climb at a faster airspeed or possibly open the cowl flaps.



The challenges continue en route because winter weather can be quite changeable. Always obtain a weather briefing and file a flight plan. AOPA reminds pilots that “mountain flying and bad weather don’t mix. Set personal limits and stick to them.”

One the biggest problems en route is Carburetor Ice. Carburetor ice generally forms in temperatures between 32 and 80 degrees F, if humidity is 50% or more. If visible moisture is present, ice will form at temperatures between 15 and 32 degrees F. Winter flying involves the use of cabin heaters: be watchful for signs of carbon monoxide poisoning.

During descent and landing be watchful for signs of carburetor ice. It is better to carry a little power during the decent. One may need to use flaps and /or gear to keep speeds reasonable. Be careful you don’t descend into low visibility conditions, such as fog or low clouds. Remember on the runway, braking action may be hindered or non-existent during severe winter weather. The [AOPA](#) and the Air Safety Institute provides many good safety publications, material and [courses](#). A good pilot is always learning.

## Retirement of Jan Jackson (Senior Forecaster)

Jan will be retiring this December after 33 years of government service, including 29 years with the National Weather Service. Jan began his weather career with the USAF in 1973. During the four years that he spent in the military, he served as weather observer, plotted surface and upper air charts, and conducted radar operations. Jan began his career with the NWS in 1982, when he was selected for a Veterans Readjustment Act Meteorological Technician position at Waycross GA performing upper-air and WSR-57 network radar operations. In 1984, he relocated to WSO Roanoke, VA as a Meteorological Technician. In 1994, he was selected and reported for duty as a General Forecaster at the spin-up WFO in Blacksburg, VA, and in 1996, was promoted to Senior Forecaster. While at Blacksburg, Jan has served as NWSEO steward (1999 to 2009), and has been instrumental in the development of the offices formidable hydrologic program – authoring Flash Flood Climatology and Dense Fog Climatology technical attachments, and building hydrologic databases. Jan has faithfully discharged his meteorological duties with excellence throughout his career and will be greatly missed by the Blacksburg staff.



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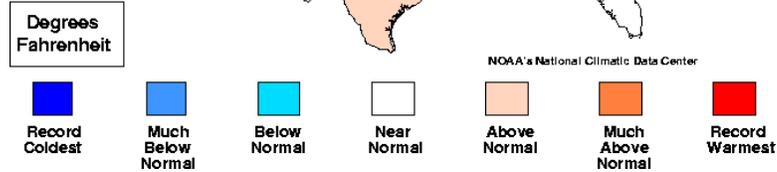
## 2001 Temperature



## 2001 Precipitation



## 2009 Temperature



## Winter 2011-2012 Outlook A Weak to Moderate La Niña Expected

By Will Perry (Senior Forecaster)

The latest winter outlook suggests a weak to moderate La Niña episode, as opposed to a strong La Niña that we had last winter. For our general area, the El Niño Southern Oscillation (ENSO), which the El Niño, and La Niña come from, does not have a direct effect, but combined with other northern Hemispheric patterns, such as the North Atlantic Oscillation (NAO), and the Pacific-North American Pattern (PNA), can lead to variable weather conditions. Currently, the forecast is for a weak and maybe moderate La Niña this upcoming winter. Looking over the past two decades, there were two instances of having a strong La Niña the year before, followed by a weak/moderate La Niña. These were the winters of 2000-2001, and 2008-2009.

For our general area, the winter of 2000-2001 was characterized by cooler than normal temperatures, but below normal precipitation. See images for national averages. The NAO during that winter was slightly negative, while the PNA was positive December into January, meaning that an upper trough was the dominant feature in the east. This kept moisture suppressed to the south with clipper systems bringing the snowfall. According to local records, Bluefield had one of the least snowy winters (December-February) on record, with 2.3 inches falling.

The winter of 2008-2009, December-February was





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So for this winter, you can keep abreast of the forecast, when there is a watch, warning or advisory in place in our forecast coverage area, by visiting our Significant Weather page. When a watch, warning or advisory is in place, there will be a news items titled Current Weather Event. This headline will also be highlighted red on the left hand menu.

The web site for you to bookmark for significant winter weather is

The screenshot shows the NOAA National Weather Service Forecast Office website for Blacksburg, VA. The page has a blue header with the NOAA logo and the text 'National Weather Service Forecast Office Blacksburg, VA'. Below the header are navigation tabs for 'Home', 'News', and 'Organization'. On the left side, there is a vertical menu with various links, including 'Current Hazards', 'Local Hazards', 'Local Storm Reports', and 'Current Weather Event', which is highlighted in red. The main content area features a 'Top News of the Day' section with a red arrow pointing to 'Current Weather Event'. Below this is a map of the Blacksburg, VA area with various weather alerts indicated by colored overlays. The map includes labels for cities like Charleston, Beckley, Lewisburg, Bluefield, Roanoke, Lynchburg, Farmville, Wytheville, Mount Airy, Danville, Boone, Winston-Salem, and Greensboro. The map is titled 'Quick Glimpse at the Weather and Local Hazards' and includes a legend for 'Hazardous Weather Outlook' and 'Short Term Forecast'.

[http://www.erh.noaa.gov/rnk/emer/emer\\_winter.php](http://www.erh.noaa.gov/rnk/emer/emer_winter.php)

This page will have snowfall, ice or rainfall forecast graphics, and usually another map highlighting where the watches, warning, and advisories are.

Reference Websites Used for this article:

ENSO Historical Years [http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/ensostuff/ensoyears.shtml](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml)

North Atlantic Oscillation Time Series

<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.timeseries.gif>

Pacific-North American Pattern Series <http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/pna.timeseries.gif>

## Winter Preparedness Tips!

- ❖ Keep fire extinguishers on hand and know how to use them
- ❖ Never burn charcoal indoors.
- ❖ Have your vehicle(s) winterized before the winter storm season. Keeping your vehicle in good condition will decrease your chance of being stranded in cold weather. Have a mechanic check your battery, antifreeze, wipers and windshield washer fluid, ignition system, thermostat, lights, flashing hazard lights, exhaust system, heater, brakes, defroster, and oil. Install good winter tires.



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## 2011 - The Year of the Tornadoes!

By Steve Keighton (Science and Operations Officer)



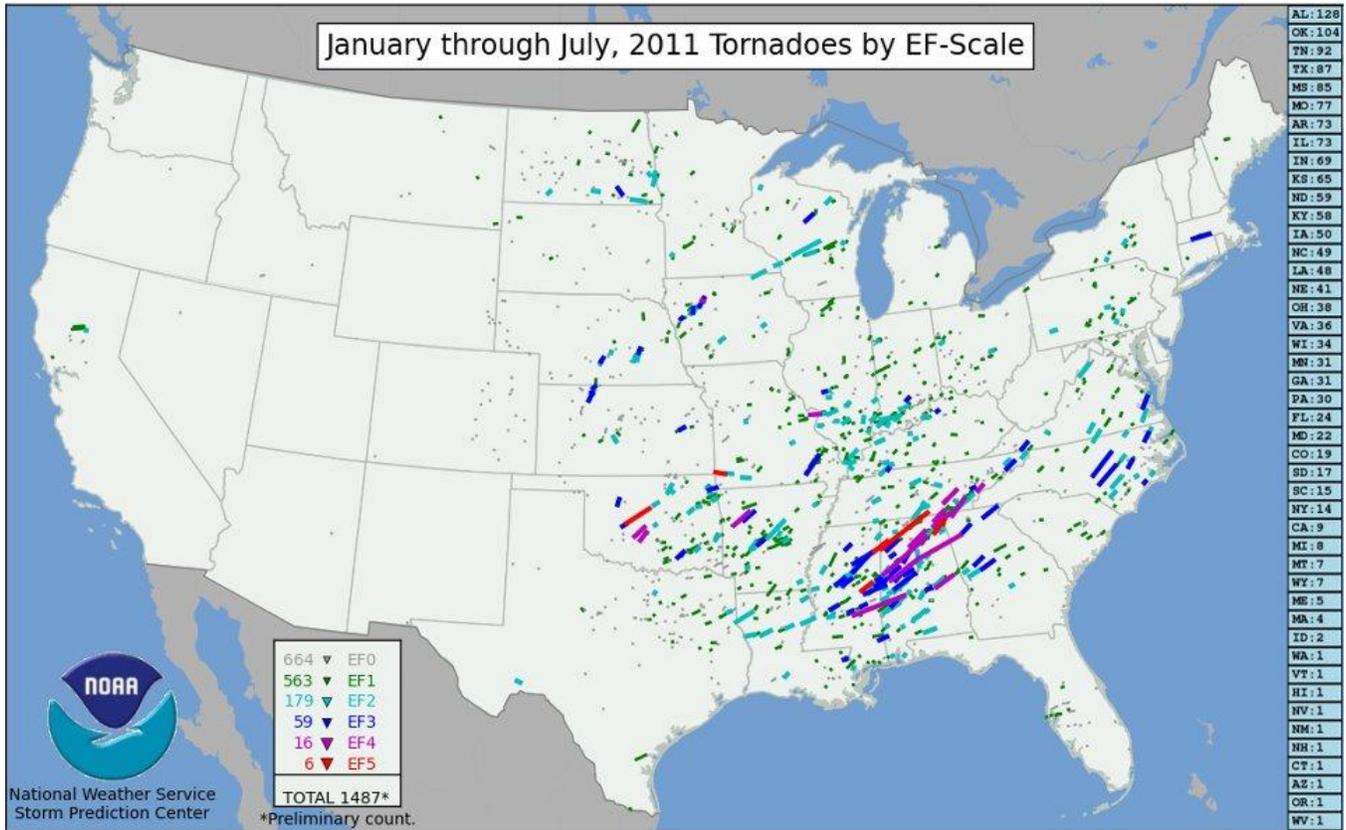
Photo of the April 8, 2011 Pulaski EF2 tornado on the left, and some of the destruction it created in the town of Pulaski.

2011 will go down in history as an unprecedented year for tornadoes across the entire U.S., especially the number of violent/killer tornadoes that occurred with several major outbreaks across parts of the Southeast U.S., as well as the Plains and Midwest. This was also a record year for the number of tornadoes within the [Blacksburg National Weather Service County Warning Area \(CWA\)](#) since this office was established in 1995. We have had 13 tornadoes through Nov 16, and many of these were associated with some of the major outbreaks during the spring, which had a much more significant impact on much larger regions. This summary will focus on a review of the tornadoes that impacted our County Warning Area (27 counties in southwest and south-central VA, nine counties in northwest and north-central NC, and four counties in southeast WV), but will also touch on the larger outbreaks across the U.S.

Preliminary statistics through mid-November show that the U.S. has experienced 1,877 tornadoes (109 of which were in NC and 55 in VA), with 552 total deaths. If this number of fatalities does not change before Dec 31, it will mean 2011 is tied for the 2<sup>nd</sup> deadliest tornado year ever since these statistics have been kept beginning in 1875. The highest number of fatalities was 794 in 1925 (the year of the March 18 Tri-State outbreak when most of these lives were lost). The 552 deaths in 2011 far surpass another deadly year in many people's memory, 1974 which included the Palm Sunday outbreak across the Ohio Valley (with tornadoes that reached into the Roanoke Valley). The final tornado count for 2011 should also be the highest in recorded history. The 55 tornadoes in Virginia is not a record however, with 83 being recorded in 2004, many of which were associated with the remnants of Hurricane Ivan on September 17.



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U.S. tornadoes plotted by [EF-Scale](#), January – July 2011.

Major to historic outbreak days across the U.S. this year included April 4, April 14-16, April 19, April 25-28 (the largest tornado outbreak in U.S. history), May 22 (included Joplin, MO deadly tornado), and May 24-25 (from Texas to the upper Midwest). The Blacksburg CWA was impacted by a few of these outbreaks, including April 4 (1 tornado), April 16 (3 tornadoes), April 27-28 (4 tornadoes, one of which resulted in a fatality, the first in our area since 1998). We also experienced tornadoes on April 8 (2 tornadoes in Pulaski County, with 6 injuries), Sept 5 (2 tornadoes near the Blue Ridge associated with the remnants of Tropical Storm Lee), and Nov 16 (1 tornado in Pittsylvania County with shallow “bow echo” linear-type storms). A total of 13 tornadoes through Nov 16 have occurred this year in the Blacksburg County Warning Area, which is more than any other year since the office was established in 1995 (there were 10 in 1998, and again in 2004).

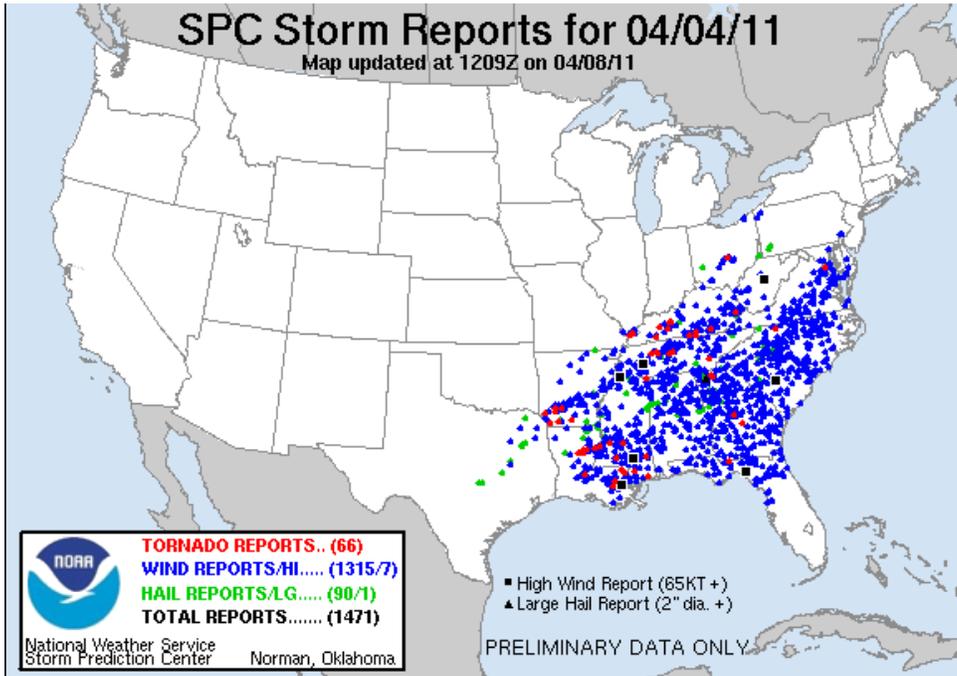
Following are some maps that show preliminary severe weather plots (tornadoes in red) for some of these larger outbreaks that also impacted the Blacksburg CWA, and a brief description of the event in terms of the local impact, each with a link to a more thorough event summary found on our web page.



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April 4-5, 2011

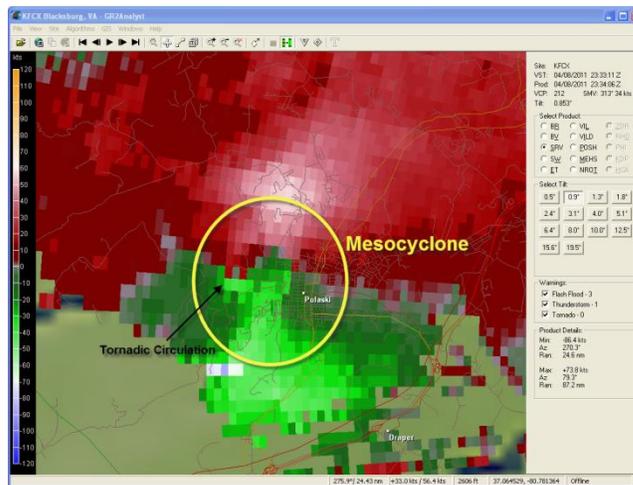
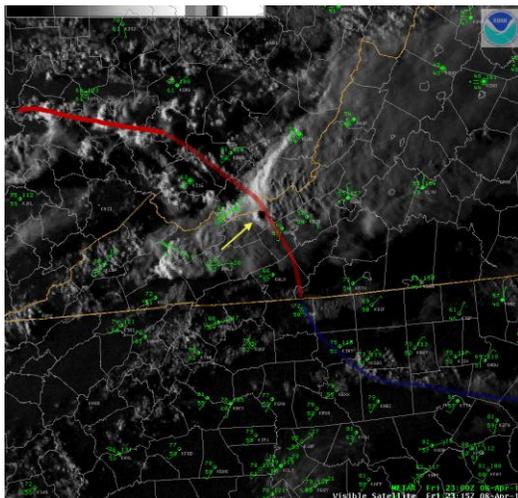


National map of severe weather reports from April 4 (tornadoes in red).

A widespread severe weather outbreak impacted much of the Southeast U.S. on April 8, primarily with straight line wind damage associated with quasi-linear squall lines (QLCS). As is often the case, some of the lines bowed out and had embedded circulations within them, and a several tornadoes were also produced. The line came through the southern Appalachians late at night,

and to some degree broke apart, but began to re-intensify just on the east side of the Blue Ridge. One of the cells within the line produced a brief EF1 tornado at 1:25am (early on April 5) near Ararat in Surry County NC. A large number of homes suffered damage. More information can be found [here](#).

April 8, 2011



Satellite image showing storm location and frontal positions (left), and Doppler radar velocity close-up showing mesocyclone and tornadic circulations over Pulaski.

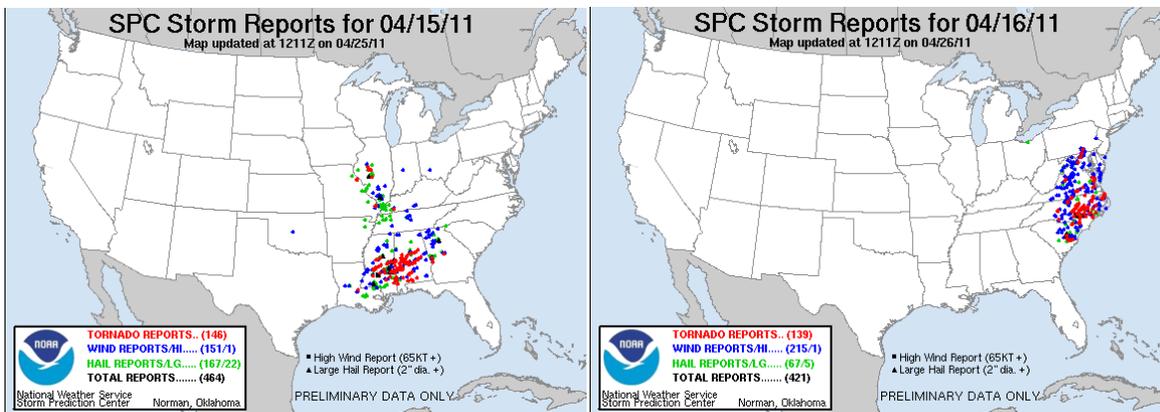


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Isolated supercells moved from northwest to southeast through the Appalachians during the afternoon and evening on April 8. One storm was closely following a warm-frontal boundary through the New River Valley, and the localized wind shear along this boundary likely contributed to this supercell storm developing the low-level rotation responsible for bringing two different tornadoes to the ground. The first one resulted in EF2 damage in Pulaski and several injuries. The second one developed near Draper Mountain, crossed I-81, and did considerable EF1 damage in the Draper community, along with one injury. Supercells and tornadoes moving from northwest to southeast have occurred before in our region, but this is a less common storm motion than the more typical southwest to northeast. More information about this event can be found [here](#).

## April 16, 2011



National maps of severe weather reports on both April 15 (left) and April 16 (right). Tornadoes are in red.

April 15 and 16<sup>th</sup> was considered one of the most significant tornado outbreaks in recent years at the time, and the final total of 30 tornadoes on the 16<sup>th</sup> in North Carolina rank as one of the biggest outbreaks ever for the state. In the Blacksburg CWA, storms that could be classified as a hybrid supercells and bow echoes, or perhaps "HP" (high precipitation) supercells, produced three separate tornadoes. Two of them were fairly long-track tornadoes that began farther south in Raleigh's CWA, producing EF2 and EF1 damage respectively in north-central NC and Southside VA, and a weaker one west of the Blue Ridge moving almost due north in Rockbridge County. The EF2 (in Halifax Co, VA) was on the ground for over 16 miles and resulted in 4 injuries. More information on this event can be found [here](#).

### Winter Preparedness Tips

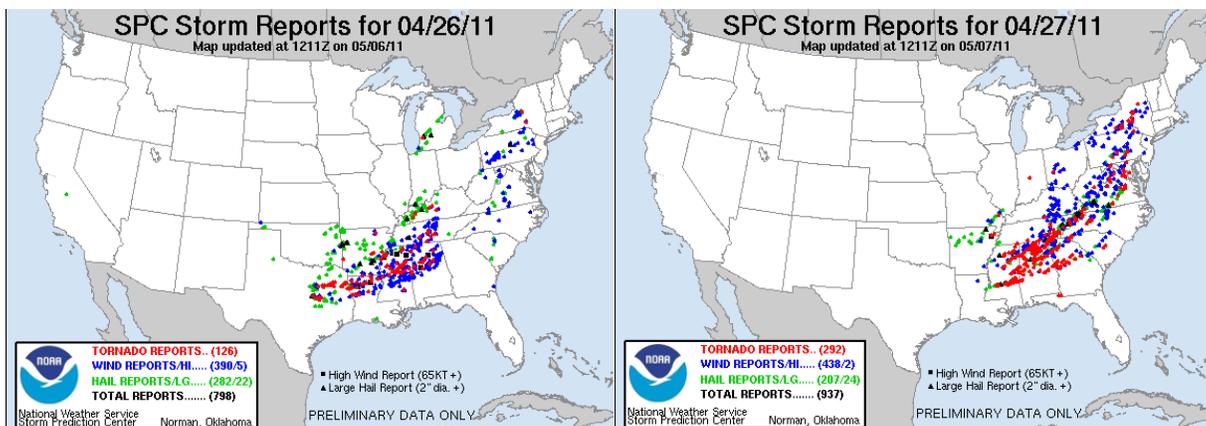
- ❖ Put together a separate disaster supply kit for the trunk of each vehicle used by members of your household. This kit should include: Blankets; rain gear and extra sets of dry clothing; plastic bags for sanitation; several bottles of water; high energy 'munchies'; a small shovel; jumper cables; a first aid kit; a flash light with extra batteries; cell phone; and a brightly colored cloth to tie to the antenna.
- ❖ In your home and car have a battery powered NOAA Weather Radio All- Hazards.



# NOAA 'Bout Weather



April 27-28, 2011



National maps of severe weather reports on both April 26 (left) and April 27 (right). Tornadoes are in red.



EF2 damage near Chilhowie from near the end point of a long-track tornado that had been on the ground for over 20 miles.

A multi-day major tornado outbreak, culminating on April 27 (spilling into the early morning hours of the 28<sup>th</sup>), is now the nation's largest tornado outbreak on record. Significant and deadly tornadoes associated with classic supercell thunderstorms moved toward the Blacksburg CWA from the southwest late on the 27<sup>th</sup>, and one long track killer tornado paralleled and slowly crossed I-81 at Glade Spring in Washington Co, VA (Morristown TN CWA), and then crossed into Smyth Co near Chilhowie (Blacksburg CWA) before finally dissipating after 1am April 28th. It produced EF2 damage in Smyth Co (and EF3 damage in Washington Co), with only one injury in our CWA. Another strong (EF2) tornado earlier in the evening tracked through Halifax Co between Halifax and Brookneal, was on the ground for 18 miles, and unfortunately resulted in 1 fatality and 8 injuries. Two other weaker tornadoes were confirmed from this event in our area, one in the Grindstone Campground of the Mount Rogers National Recreation area near the Smyth/Grayson border, where about 200 trees were blown down in the campground at an elevation of just under 4,000 ft on the north side of Mount Rogers, and another touchdown discovered some days later in a remote area of northwest Botetourt County.

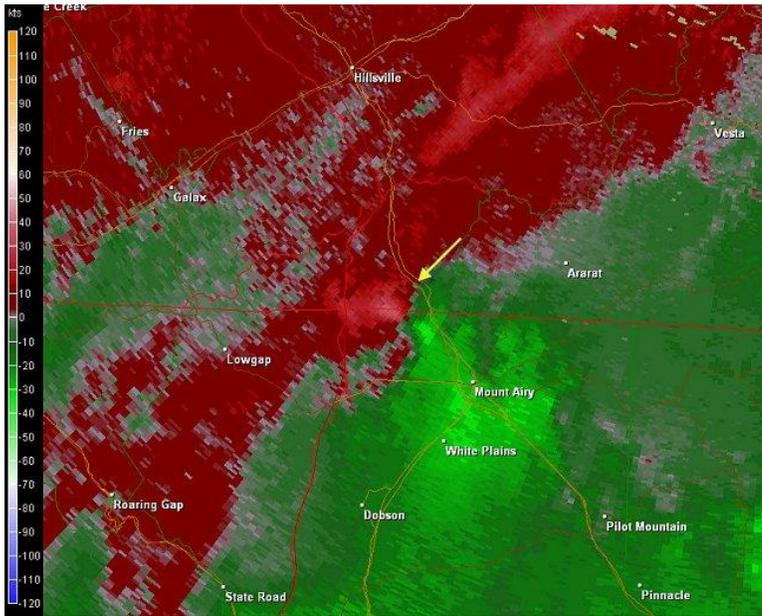


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There were quite possibly other brief touchdowns in remote areas that we never learned about, as many storms were observed to have significant low-level rotation signatures as they moved northeast through the area late that night. More information on this event can be found [here](#).

## Sept 5, 2011



Doppler velocity image showing the circulation that spawned the EF0 tornado moments later in Cana (yellow arrow).

The remnants of Tropical Storm Lee tracked northeast along the spine of the Appalachians, and followed a nearly stationary frontal boundary as well. Heavier rain bands developed on the east side of the remnant low pressure center, and as often the case with spinning tropical remnants, some of these developed tighter circulations as the updrafts stretched the broader circulation within this environment. Two separate tornadoes quickly developed in these bands, one in the late afternoon in Wilkes Co NC on the south edge of Stone Mountain State Park (EF1 damage), and the other late in the evening, very briefly at a gas station in Cana (Carroll

Co) VA (EF0 damage, and two minor injuries). Both were essentially at the base of the Blue Ridge, and were moving almost due north, but did not move up the ridge. You can find more information about this event, which also produced some minor flooding, [here](#).

## Nov 16, 2011

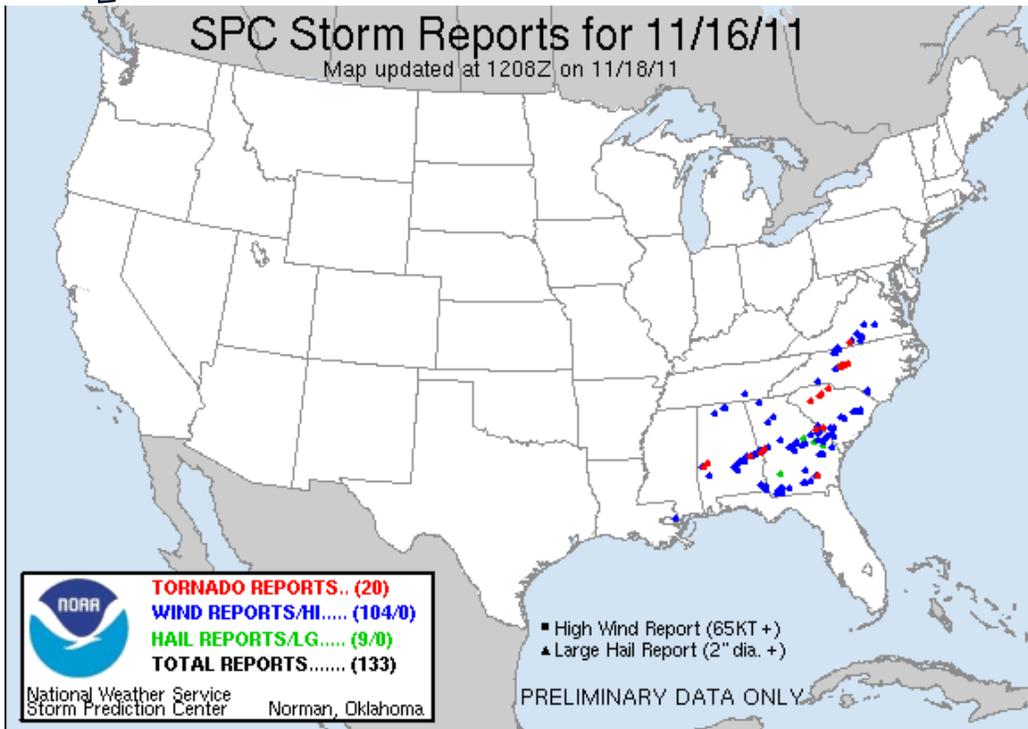
A line of showers (only isolated embedded thunder) formed ahead of a strong cold front in the early evening hours, and developed some bow echo characteristics as it moved quickly east into the Piedmont of Virginia and North Carolina. One of these bow echoes spawned an EF1 tornado in central Pittsylvania Co near Dry Fork, VA. The environment was not very unstable, but there was just enough CAPE, and combined with the very strong wind shear, this made brief spin-up tornadoes possible. The environment was even more favorable a little farther south, in South Carolina and North Carolina, where stronger and longer track tornadoes occurred south of Charlotte and also south of Winston-Salem, associated with supercells. There were a few fatalities, unfortunately, with those tornadoes. For more information on the tornado in Pittsylvania Co, click [here](#).

### Winter Preparedness Tips!

- ❖ Know the difference between a Winter Storm Watch, Warning, and Advisory. A watch means winter storm conditions are possible within the next 36-48 hours. A warning means life-threatening severe winter conditions have begun or will begin within 24 hours. Act now! An advisory means winter weather conditions are expected to cause significant inconveniences and may be hazardous. If you are cautious, these situations should not be life threatening.
- ❖ Don't forget about your pets! Make sure they have food, water and shelter.



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Map of severe weather reports (tornadoes in red) from the November 16 event across the Southeast U.S.

In summary, 2011 was obviously a record breaking year for tornadoes, not only across the United States, but in our region as well. There may be no clear explanation for why this year was so active, and why there were especially so many violent and deadly tornadoes, other than that large scale weather patterns often get locked in where they can repeat themselves over the course of a month or so (like in April). In this case, that weather pattern happened to favor environments where the ingredients came into place perfectly for the most dangerous kinds of supercell thunderstorms that can last for several hours. No one can say if these kinds of outbreaks are likely again over the next several years, but it is always possible, and everyone (whether you are in tornado-prone areas or not), should always be prepared to act in a way to maximize safety should such environments develop again.

You can find more information about tornado safety, preparedness, environments, and plenty of other great stuff on severe weather awareness in general at the following site:

<http://www.nws.noaa.gov/om/severeweather/index.shtml>

## *The Snow (Continued from : The "Great Appalachian Storm" of 1950*

A widespread area of 20-30 inch snowfalls blanketed eastern Ohio, West Virginia and western Pennsylvania. November 1950 became West Virginia's snowiest month on record. Many buildings collapsed under the weight of 2 to 3 feet of snow. Roads were closed, trains and buses canceled. People could not leave their homes for days. Milk and bread and other delivery trucks could not get through. School buses were halted as snow

Fall 2011 Edition



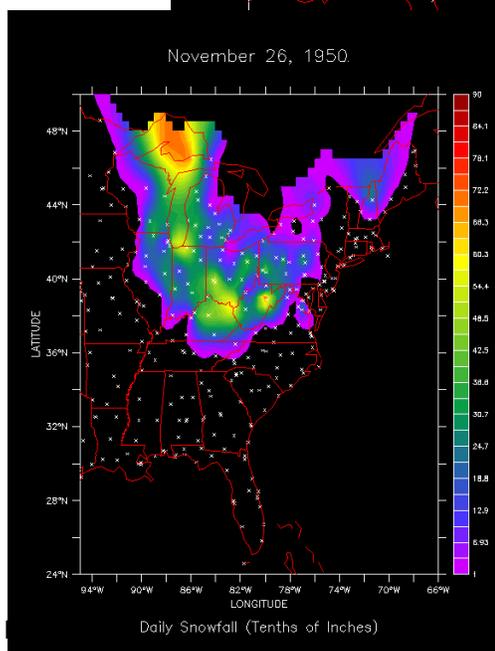
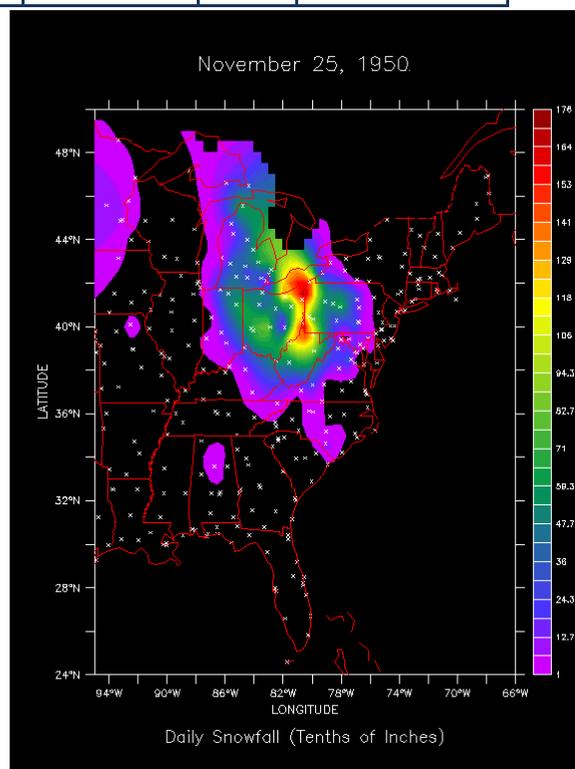
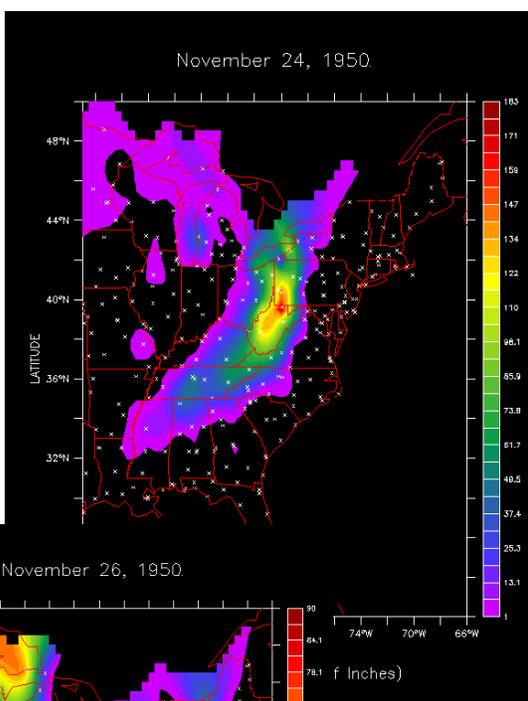
# NOAA 'Bout Weather



clearing was much different in those days since they used no salt on the roads. Steubenville, OH's snowfall exceeded 44 inches with snowdrifts up to 25 feet.

Other notable snowfall amounts include:

City	State	Snowfall (in.)	City	State	Snowfall (in.)
Coburn Creek	WV	62	Paintsville	KY	14
Pickens	WV	57	Hazard	KY	13
Steubenville	OH	44	Manchester	KY	13
Parkersburg	WV	34.4	Dayton	OH	12
Pittsburgh	PA	30.5	Pineville	KY	11
Elkins	WV	30	Birmingham	AL	1



In southeast West Virginia, southwest Virginia and northwest North Carolina snowfall amounts ranged from 20 to 30 inches in the mountains of southeast West Virginia to less than one inch from



# NOAA 'Bout Weather



Lynchburg to central North Carolina. The following table shows total snowfall from November 25<sup>th</sup> to November 29<sup>th</sup>.

Location	Snowfall (inches)	Location	Snowfall (inches)
Elkins, WV	33.8	Copper Hill, VA	6
Flat Top, WV	20.4	Roanoke, VA	5.6
White Sulphur Springs, WV	19.5	Martinsville, VA	5
Burkes Garden, VA	19	Stuart, VA	4
Union 3SSE, WV	18	Lexington, VA	3.5
Buchanan, VA	15	Kerrs Creek 6WNW, VA	1.13
Wytheville 1S, VA	14	Danbury, NC	3
Hot Springs, VA	14	Eden, NC	2
Sparta 2SSW, NC	13.1	North Wilkesboro, NC	1.5
Bluestone Lake, WV	12.5	Huddleston 4SW, VA	1
Princeton, WV	12.5	Pedlar Dam, VA	0.8
Covington, VA	12	Transou, NC	0.5
Glen Lyn, VA	10	Danville, VA	0.3
Hillsville, VA	10	Altavista, VA	0.3
Saltville 1N, VA	8	Buckingham, VA	0.2
New Castle, VA	8	Bedford, VA	0
Newport 2NNW, VA	8	Charlotte Court House, VA	0
Galax, VA	7	Lynchburg, VA	T
Idlewild, NC	6.5	Chatham, VA	T
Jefferson 2ESE, NC	6	Appomattox, VA	T

Three men shoveling snow in front of Wayne Feeds on the corner of School Avenue and Hewes Street in Clarksburg, WV. Courtesy of Appalachian History





# NOAA 'Bout Weather



## The Wind

The pressure gradient between the 991 millibar low (29.26 inches), strong high pressure to the north and another high over the Mississippi Valley, produced very strong winds of 40 to 60 mph. This resulted in blizzard conditions over a wide area. The intense winds caused extensive tree damage and power outages and whipped up surf on the beaches. The resulting coastal flooding breached dikes at LaGuardia Airport in New York flooding runways. Because the winds occurred at high tide along the coast, there was destructive flooding as well. Many trees and power lines were blown down across the region, and wind damage was extensive in New York State, totaling 20 million dollars at the time.

### Impressive wind gusts from this storm include:

City	State	Wind Gust(mph)
Mt. Washington	NH	160
Bear Mountain	NY	140
Concord	NH	110
Newark	NJ	108
Hartford	CT	100
New York	NY	94
Allentown	PA	88
Albany	NY	83
Central Park	NY	70
Buffalo	NY	50



Damage from the Great Appalachian Storm – The Vermonter

## Rain...Freezing rain and flooding

The following table shows the rainfall for locations in and near the Blacksburg County Warning area from November 25 to November 26.

Location	Rain (Inches)	Location	Rain (Inches)
White Sulphur Springs, WV	1.74	Princeton, WV	0.83
Elkins, WV	1.58	Martinsville, VA	0.83
Hot Springs, VA	1.57	Lynchburg, VA	0.80
Union 3SSE, WV	1.48	Saltville 1N, VA	0.80
Wytheville 1S, VA	1.4	Concord 5S, VA	0.76



# NOAA 'Bout Weather



Sparta 2SSW, NC	1.31	Bedford, VA	0.75
Covington, VA	1.28	Huddleston 4SW, VA	0.73
Idlewild, NC	1.27	Galax, VA	0.70
Glen Lyn, VA	1.22	Danville, VA	0.70
Buckingham, VA	1.19	Stuart, VA	0.65
Bluestone Lake, WV	1.18	Roanoke, VA	0.62
Burkes Garden, VA	1.17	North Wilkesboro, NC	0.57
Chatham, VA	1.15	Woolwine, VA	0.52
Flat Top, WV	1.15	Appomattox, VA	0.48
Pedlar Dam, VA	1.15	Hillsville, VA	0.47
Lexington, VA	1.13	Eden, NC	0.46
Buchanan, VA	1.00	Brookneal, VA	0.45
Newport 2NNW, VA	1.00	Danbury, NC	0.40
Kerrs Creek 6WNW, NC	1.00	Jefferson 2ESE, NC	0.35
Altavista, VA	0.98	Copper Hill, VA	0.30
Goshen, VA	0.98	Yadkinville, NC	0.25
Troutdale 3SSE, VA	0.94	Transou, NC	0.22
Charlotte Court House, VA	0.86	Blowing Rock 1NW, NC	0.20
New Castle, VA	0.84		

Freezing rain fell nonstop for 12 hours in parts of southwest Pennsylvania. Altoona was isolated for two days. It took weeks to restore electricity to residents and businesses. Tyrone, PA didn't get the ice, but parts of the borough were under water after the Little Juniata River crested about 5 feet above flood stage. Timber in a 15-mile radius of Altoona also took a beating from the ice. It was estimated that it would take 15 to 20 years for the forests to regenerate from the damage. Pennsylvania Gov. James H. Duff, fresh off his U.S. Senate victory ordered the closing of banks in Blair, PA and 16 other western Pennsylvania counties for two days after bankers said their employees were unable to report to work. Duff also activated the Pennsylvania National Guard, which patrolled Tyrone streets for a time after the flooding there. The storm caused \$20 million damage locally or \$182.3 million in 2010 dollars, based on the Consumer Price Index.

Very heavy rains fell on the east or warm side of the storm. The heavy rain brought near-record flooding to eastern Pennsylvania and extreme damage to Southern New Jersey, particularly along Delaware Bay. The highest tide of record to that time, 8.8 feet above mean sea level was recorded at Greenwich Piers, NJ, equal to the estimated height during the October 1878 hurricane. The fishing village of Bay Side was practically washed out with damages estimated at \$50,000. Waves from 12-18 feet high were reported in the East Point, NJ, area.



# NOAA 'Bout Weather



At the Philadelphia tide gauge located on the Delaware River, the tide rose to a record height of 10.8 feet. Severe tidal flooding begins at 10.2 feet. Slide Mountain, NY received 7.78 inches of rain.

## *Football*

In Columbus, Ohio, preparations were underway at The Horseshoe for the game of the college football year between Ohio State and Michigan. The Athletic Directors decided to play the game despite the fact that roads were blocked by snowdrifts over nearly the entire state.

So with a record low Saturday morning temperature of 5 degrees and winds of 40 mph, nearly 50,000 fans showed up to watch the “Blizzard Bowl,” or the “Snow Bowl of 1950” with the Big Ten championship and a trip to the Rose Bowl on the line. Michigan won the game 9–3 without making a single first down and only gaining 27 yards on offense.

The tarps were frozen to the field and visibility was so limited by heavy snow throughout the game that it was nearly impossible to see the players from the press box. 9 inches of snow would be on the ground by early evening. Finding the yard markers and even the players sometimes was a chore. The poor field conditions resulted in 45 punts during the game.

## *Hidden Benefit*

The “Great Appalachian Storm” became the focus of major changes in the way forecasters predicted the weather. It was used as a model of how computer modeling could be used to better predict the weather. U.S. Weather Bureau meteorologist Norm Phillips was the first to show it was possible to predict the weather using a numerical model.

Because of Phillips' work, the Joint Numerical Weather Prediction Unit (JNWPU) was created in July 1954 with the weather bureau (now the National Weather Service) and the U.S. Army and Navy. The JNWPU then became the National Meteorological Center, and, subsequently, the present day National Center for Environmental Prediction (NCEP).

In recognition of the pioneering work of Norm Phillips in numerical weather prediction, this case that served as a catalyst in the creation of operational numerical modeling was revisited by National Centers for Environmental Prediction as part of the 50 year NCEP/NCAR Reanalysis, Kistler, et al (2001). Environmental conditions leading up to the storm in 1950 were input into a version of modern numerical models. Among other results of the reanalysis, the 24 hour high resolution forecast at 850 millibars was highly accurate.

## *Summary*

Heavy winds, rain and blizzard conditions followed an extratropical cyclone as it moved through the Eastern United States. By the time the storm wound down on November 29<sup>th</sup> and 30<sup>th</sup>, deaths totaled 353 and more than 1,000,000 were left without electricity. Crop losses were significant. Total economic losses reached \$66.7 million (in 1950 dollars) and insurance companies wound up footing the bill, paying out more for this event than they ever had for any storm or hurricane.



# NOAA 'Bout Weather



Historically, the Great Appalachian Storm of Nov. 24-27, 1950, is ranked as a Category 5, or Extreme, storm on the Northeast Snowstorm Impact Scale. The scale focuses on area and population affected by a heavy snowfall.



Children sled riding on Brightway on Marland Heights, Weirton, WV during the 1950 Snowstorm. Courtesy of Appalachian History

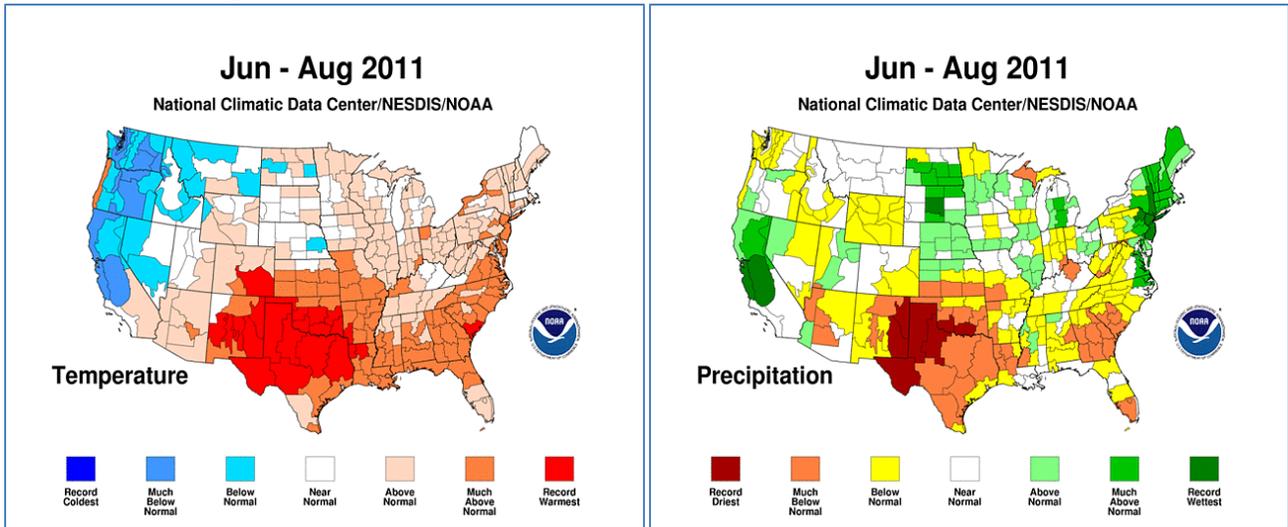
## Summer Overview and Monthly Summaries

By Marc Chenard (Meteorologist Intern)

The summer of 2011 (Jun-Aug) featured above normal temperatures and below normal precipitation across our region. After averaging all available data, North Carolina saw its 2<sup>nd</sup> hottest summer ever, Virginia its 4<sup>th</sup> hottest and West Virginia its 14<sup>th</sup> hottest. These records date back 117 years. On a more local scale, Roanoke and Blacksburg experienced their 2<sup>nd</sup> warmest summer temperature on record, with the summer of 2010 the only summer hotter. Each of the summer months featured below normal precipitation, with August being the driest. Danville, Blacksburg and Bluefield all recorded a top ten driest summer on record, with Danville's summer actually being the 2<sup>nd</sup> driest on record. The maps below show that much of the central and eastern part of the country experienced above normal temperatures, owing to the fact that a large ridge of upper level high pressure centered over the central U.S. dominated the summer pattern.



# NOAA 'Bout Weather



Climate Site	AVG Temperature (Anomaly)	AVG Max Temp (Anomaly)	AVG MIN Temp (Anomaly)	Total Precipitation (Anomaly)	# 90 degree days (Anomaly)
Bluefield	73.9 (+2.2)	83.5 (+3.3)	64.3	7.49 (-4.08)	8 (+5.1)
Blacksburg	72.6 (+2.9)	84.1 (+3.2)	61.2 (+2.8)	7.81 (-4.04)	8 (+3.9)
Roanoke	77.9 (+2.9)	88.6 (+3.2)	67.2 (+2.6)	8.72 (-2.71)	38 (+15.8)
Lynchburg	76.2 (+2.5)	88.2 (+3.2)	64.2 (+1.8)	8.86 (-2.38)	40 (+20.9)
Danville	77.8 (+1.1)	90.1 (+3.9)	65.5 (-1.7)	6.91 (-5.50)	53 (+27.4)

Table 1: Summer (Jun-Aug) Climate Statistics

## June Review

June was a warm, humid and dry month across the Blacksburg County Warning Area (CWA). Bluefield West Virginia recorded its highest average maximum temperature (82.5) since records began in 1959. A mean upper level ridge of high pressure was centered over the south central part of the country, which provided the above normal temperatures for our area. The first 12 days of the month started off hot and humid with an upper level ridge centered over the south central United States. Weak cold fronts pushed through on the 5<sup>th</sup> and 11<sup>th</sup> bringing scattered showers and thunderstorms. On the 13<sup>th</sup> a stronger cold front pushed across ushering a few days of cooler and less humid weather. The above normal temperatures returned on the 16<sup>th</sup> and lasted for much of the remainder of the month, with just a quick cool down on the 25<sup>th</sup>/26<sup>th</sup> behind another front. A stronger front moved through on the 28<sup>th</sup> and 29<sup>th</sup> bringing strong to severe thunderstorms and a slight cool down to end the month. In general, most of our monthly precipitation was from scattered showers and thunderstorms with these mainly weak frontal passages. Otherwise precipitation chances were limited to pop up thunderstorms that formed in the hot and humid environment. The 9<sup>th</sup> was the most active of these days, with numerous showers and thunderstorms, some of which became severe. Overall, June was a very busy severe weather month, with 154 Severe Thunderstorm or Tornado Warnings issued by our office and over 300 reports of severe weather.

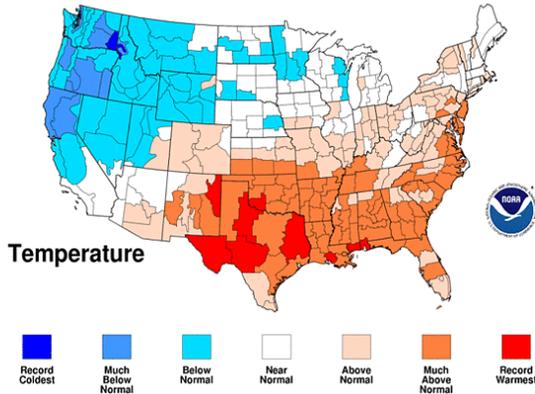


# NOAA 'Bout Weather



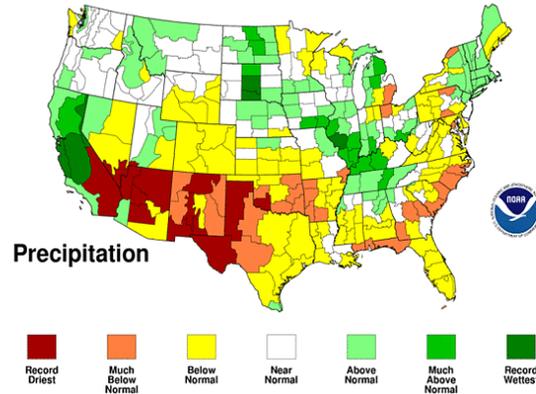
## Jun 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



## Jun 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



Temperature

Precipitation

Climate Site	AVG Temperature (Anomaly)	AVG Max Temp (Anomaly)	AVG MIN Temp (Anomaly)	Total Precipitation (Anomaly)
Bluefield	72.1 (+4.1)	82.5 (+5.7)	61.8 (+2.6)	1.81 (-2.04)
Blacksburg	70.3 (+3.4)	82.5 (+3.9)	58.1 (+2.9)	2.78 (-1.15)
Roanoke	75.8 (+3.9)	87.0 (+3.7)	64.6 (+4.2)	3.51 (-0.17)
Lynchburg	74.1 (+3.1)	86.2 (+3.7)	62.0 (+2.5)	3.81 (+0.02)
Danville	75.6 (+1.2)	88.3 (+2.1)	63.0 (+0.4)	1.56 (-1.94)

Table 2: June Climate Statistics

## July Review

July was another month that featured well above normal temperatures across the region, owing to a large upper level ridge of high pressure centered over the central and eastern part of the country. This ridge also kept frontal passages and precipitation amounts on the low side. Although July was generally wetter than June, it was still below normal across most of our County Warning Area. Bluefield West Virginia's average temperature of 76.2 was the highest since records began in 1959, while Roanoke's 80.2 tied its highest, with records going back to 1912. The humid weather allowed for very warm monthly average low temperatures at Blacksburg and Roanoke, with both sites setting a monthly record for warmest low temperatures. Most days of the month featured above normal temperatures and humid conditions, with just a few days mid month (14-16<sup>th</sup>) seeing cooler and less humid weather as a high pressure built in behind a stronger cold front. Our most active weather day of the month was on July 4<sup>th</sup>. Hot and humid conditions on the 4<sup>th</sup> allowed for the atmosphere to become unstable, while a strong wave moving along a front created rising motion. This combination allowed for the formation of widespread showers and thunderstorms, many of which became severe, with a wind gust to 75 MPH reported in Roanoke. One other big event was flash flooding in Rocky Mount on the 25<sup>th</sup>. A slow moving thunderstorm dropped 4 inches in just over 90 minutes, flooding several streets and businesses near Rocky Mount. Overall, July was a busy severe weather month, with the hot and humid weather combining with several upper level waves and weak frontal passages, to produce numerous thunderstorms. In all, 86 severe thunderstorm warnings were issued across the County Warning Area, with over 200 reports of large hail or wind damage reported.

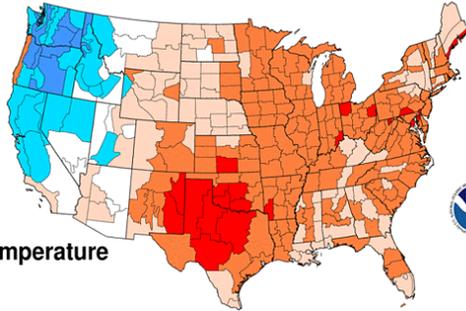


# NOAA 'Bout Weather



## Jul 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA

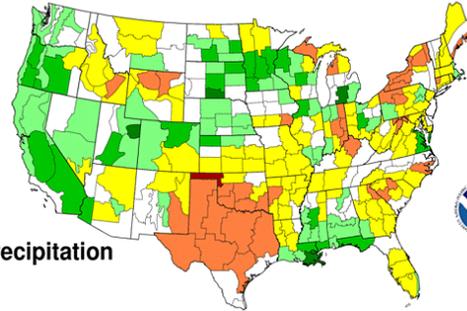


Temperature



## Jul 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



Precipitation



Climate Site	AVG Temperature (Anomaly)	AVG Max Temp (Anomaly)	AVG MIN Temp (Anomaly)	Total Precipitation (Anomaly)
Bluefield	76.2 (+4.6)	85.4 (+5.1)	67.0 (+4.1)	3.34 (-0.67)
Blacksburg	75.0 (+3.9)	85.7 (+3.2)	64.3 (+4.6)	3.78 (-0.39)
Roanoke	80.2 (+4.0)	90.5 (+3.0)	69.9 (+5.0)	3.76 (-0.24)
Lynchburg	78.6 (+3.5)	90.7 (+4.3)	66.4 (+2.7)	2.99 (-1.40)
Danville	79.9 (+1.1)	91.7 (+1.7)	68.1 (+0.5)	3.88 (-0.56)

Table 3: July Climate Statistics

## August Review

August was yet another summer month that featured above normal temperatures across the County Warning Area, although not quite as anomalously warm as June or July, as the upper level ridge of high pressure shifted slightly west for most of the month, allowing slightly cooler air to filter into the eastern part of the country. Precipitation was highly variable, as is common during summer months, but in general, was well below normal. In fact, Blacksburg saw their 3<sup>rd</sup> driest August on record. Our big severe weather events occurred on the 14<sup>th</sup>, 21<sup>st</sup> and 25<sup>th</sup>. The 14<sup>th</sup> saw a mix of large hail and wind damage as a cold front and upper level wave moved across. The 21<sup>st</sup> and 25<sup>th</sup> both had cold frontal passages that triggered lines of thunderstorms strong enough to knock down trees in the piedmont. Most of the months rain came from scattered thunderstorms, with the 6<sup>th</sup>, 13<sup>th</sup> and 25<sup>th</sup> seeing some of the highest amounts. Estimated rainfall of 2 to 2.5 inches fell across Appomattox, Campbell, Halifax and Pittsylvania counties on the 6<sup>th</sup>, around 3 to 5 inches fell across portions of Bedford and Yadkin counties on the 13<sup>th</sup>, and 2 to 4 inches fell across portions of Carroll and Campbell counties on the 25<sup>th</sup>. Hurricane Irene passed up the east coast on the 27<sup>th</sup> and 28<sup>th</sup>, however only our far eastern counties received rain from this hurricane. Although, strong winds over our eastern counties were responsible for knocking down numerous trees as Irene passed by. In total, 59 Severe Thunderstorm warnings were issued In August, with over 100 reports of either large hail or wind damaged received.

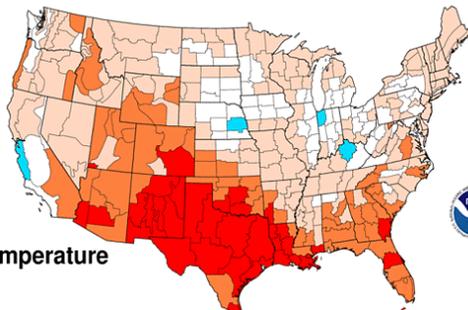


# NOAA 'Bout Weather



## Aug 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA

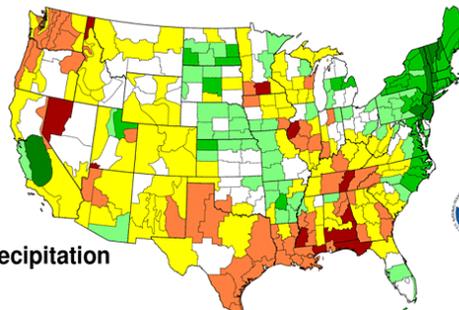


Temperature



## Aug 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



Precipitation



Climate Site	AVG Temperature (Anomaly)	AVG Max Temp (Anomaly)	AVG MIN Temp (Anomaly)	Total Precipitation (Anomaly)
Bluefield	73.4 (+1.1)	82.7 (+1.9)	64.1 (+0.4)	2.34 (-0.92)
Blacksburg	72.6 (+2.6)	84.0 (+2.6)	61.2 (+2.5)	1.25 (-2.34)
Roanoke	77.8 (+2.4)	88.4 (+2.6)	67.1 (+2.1)	1.45 (-2.11)
Lynchburg	76.1 (+2.0)	87.8 (+2.6)	64.3 (+1.3)	2.06 (-1.20)
Danville	77.8 (+0.8)	90.3 (+4.1)	65.3 (-2.6)	1.47 (-2.50)

Table 4: August Climate Statistics

## September Review

September finally saw a return to near normal temperatures and also brought abundant rainfall to the region. The upper level ridge that had been persistent over the central and eastern US gave way to a trough for much of the month of September. This trough provided the cooler temperatures and also brought deep tropical moisture into our area. Most of our rain occurred early in the month. An approaching trough triggered widespread strong to severe thunderstorms on the 2<sup>nd</sup> with large hail and wind gusts over 60 MPH. On the 5<sup>th</sup>, the remnants of Tropical Storm Lee brought widespread heavy rain of 2 to 5 inches, with isolated amounts of 6 to 9 inches along and just east of the Blue Ridge Mountains. The middle of month was quieter, with very few organized storm systems. The end of the month became a bit more active with isolated heavy rainfall on the 21<sup>st</sup> through 24<sup>th</sup> across the piedmont and northwest North Carolina. Late on the 24<sup>th</sup> into the 25<sup>th</sup>, 3 to 4 inches of rain caused significant flash flooding in Boone North Carolina.



Be sure to "Like" [The US National Weather Service Blacksburg Virginia Facebook Page](#). We will post weather updates, weather maps and links to the various products we issue. Also, we encourage the public to post questions, weather pictures and any storm reports on our page!

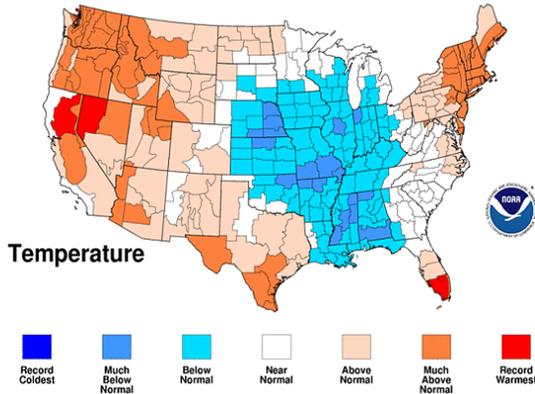


# NOAA 'Bout Weather



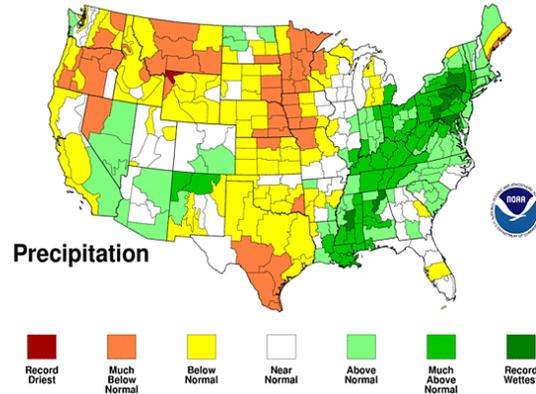
## Sep 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



## Sep 2011 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



Climate Site	AVG Temperature (Anomaly)	AVG Max Temp (Anomaly)	AVG MIN Temp (Anomaly)	Total Precipitation (Anomaly)
Bluefield	65.9 (+0.1)	74.0 (-0.6)	57.8 (+0.7)	5.56 (+2.42)
Blacksburg	64.2 (+1.1)	73.8 (-1.5)	54.5 (+3.5)	4.92 (+1.82)
Roanoke	68.8 (+0.7)	77.2 (-1.3)	60.4 (+2.8)	7.39 (+3.50)
Lynchburg	68.4 (+1.4)	77.4 (-0.9)	59.3 (+3.6)	4.49 (+0.61)
Danville	70.2 (+0.3)	80.4 (+0.6)	60.0 (-0.1)	5.52 (+1.56)

Table 5: September Climate Statistics

## Drought Overview

The maps below show our drought progression through the summer months. These maps are made each week through a partnership consisting of the U.S. Department of Agriculture (Joint Agricultural Weather Facility and National Water and Climate Center), the National Weather Service's Climate Prediction Center, National Climatic Data Center, and the National Drought Mitigation Center at the University of Nebraska Lincoln. These maps are produced using several drought indices, soil moisture data, streamflow data and precipitation anomaly data. After all this data is looked at, modifications are made by various experts across the country to try to reflect real world conditions. The maps below show that by the end of August our rainfall deficit allowed areas of moderate drought to develop across portions of southwest Virginia and north central North Carolina. An increase in rainfall in September relieved the drought conditions over much of our region. Visit <http://droughtmonitor.unl.edu/> for the latest drought information.

D0: Abnormally Dry (short term dryness, slower growth of crops)

D1: Moderate Drought (some damage to crops/pastures, water shortages developing or imminent)

D2: Severe Drought (crop or pasture losses likely, water shortages common)

D3: Extreme Drought (major crop or pasture losses, widespread water shortages)

D4: Exceptional Drought (Exceptional and widespread crop/pasture losses, water emergencies)



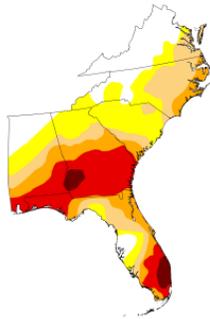
# NOAA 'Bout Weather



## U.S. Drought Monitor Southeast

June 7, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	19.53	80.47	56.67	37.28	21.58	2.72
Last Week (05/31/2011 map)	27.03	72.97	50.55	34.62	19.75	0.46
3 Months Ago (03/08/2011 map)	10.94	89.06	68.98	22.79	4.81	0.00
Start of Calendar Year (12/28/2010 map)	23.01	76.99	51.84	23.55	5.63	0.00
Start of Water Year (09/28/2010 map)	18.18	81.82	38.04	10.32	0.90	0.00
One Year Ago (06/01/2010 map)	94.25	5.75	0.00	0.00	0.00	0.00



**Intensity:**  
 D0 Abnormally Dry  
 D1 Drought - Moderate  
 D2 Drought - Severe  
 D3 Drought - Extreme  
 D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

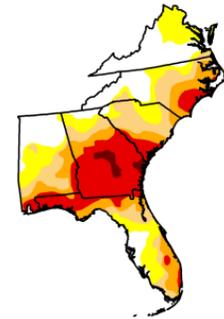


Released Thursday, June 9, 2011  
Matthew Rosenkrans, NOAA/NWS/NCEP/CPC

## U.S. Drought Monitor Southeast

July 26, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	23.35	76.65	56.69	38.99	23.37	1.82
Last Week (07/19/2011 map)	26.23	73.77	57.01	38.84	24.00	1.82
3 Months Ago (04/26/2011 map)	33.45	66.55	41.90	14.99	3.08	0.00
Start of Calendar Year (12/28/2010 map)	23.01	76.99	51.84	23.55	5.63	0.00
Start of Water Year (09/28/2010 map)	18.18	81.82	38.04	10.32	0.90	0.00
One Year Ago (06/01/2010 map)	46.26	53.74	7.58	0.00	0.00	0.00



**Intensity:**  
 D0 Abnormally Dry  
 D1 Drought - Moderate  
 D2 Drought - Severe  
 D3 Drought - Extreme  
 D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

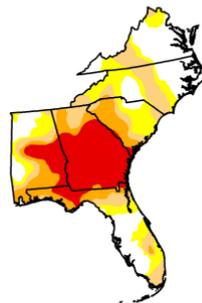


Released Thursday, July 28, 2011  
Brad Rippey, U.S. Department of Agriculture

## U.S. Drought Monitor Southeast

August 30, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	26.09	73.91	55.31	37.01	22.80	0.00
Last Week (08/23/2011 map)	25.86	74.14	53.96	33.83	12.94	0.00
3 Months Ago (05/31/2011 map)	27.03	72.97	50.55	34.62	19.75	0.46
Start of Calendar Year (12/28/2010 map)	23.01	76.99	51.84	23.55	5.63	0.00
Start of Water Year (09/28/2010 map)	18.18	81.82	38.04	10.32	0.90	0.00
One Year Ago (06/01/2010 map)	55.77	44.23	13.85	4.42	0.00	0.00



**Intensity:**  
 D0 Abnormally Dry  
 D1 Drought - Moderate  
 D2 Drought - Severe  
 D3 Drought - Extreme  
 D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

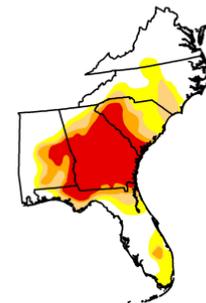


Released Thursday, September 1, 2011  
Eric Luebbehusen, USDA

## U.S. Drought Monitor Southeast

September 27, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	42.24	57.76	41.82	31.77	23.48	0.00
Last Week (09/20/2011 map)	39.31	60.69	47.98	32.53	24.16	0.00
3 Months Ago (06/28/2011 map)	15.61	84.39	62.63	44.22	29.11	14.73
Start of Calendar Year (12/28/2010 map)	23.01	76.99	51.84	23.55	5.63	0.00
Start of Water Year (09/28/2010 map)	18.18	81.82	38.04	10.32	0.90	0.00
One Year Ago (06/01/2010 map)	14.35	85.65	47.44	11.74	0.90	0.00



**Intensity:**  
 D0 Abnormally Dry  
 D1 Drought - Moderate  
 D2 Drought - Severe  
 D3 Drought - Extreme  
 D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, September 29, 2011  
Michael Brewer, National Climatic Data Center, NOAA

## Active 2011 Tropical Atlantic Yields Some Local Impact

By Jim Hudgins (Senior Forecaster)

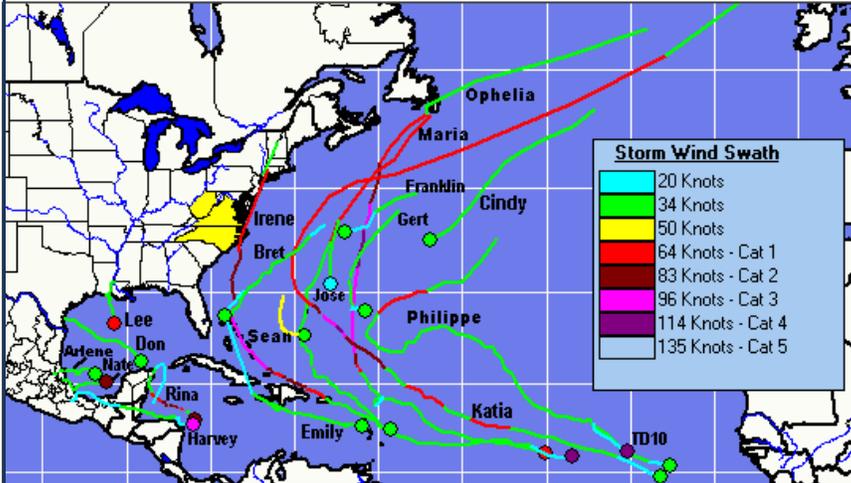
The 2011 Atlantic hurricane season was once again well above normal in the number of storms with 18 named systems (Fig 1), of which 7 became hurricanes, and 3 major hurricanes. There was also one tropical depression that never reached storm status. The average number of storms is just around 10 named cyclones including 6 hurricanes and 3 majors (Category 3+).



# NOAA 'Bout Weather



The first storm (Tropical Storm Arlene) formed on June 29<sup>th</sup> and the last system (Tropical Storm Sean) on November 8<sup>th</sup> which was tracking toward Bermuda at the time of writing on November 10<sup>th</sup>. The

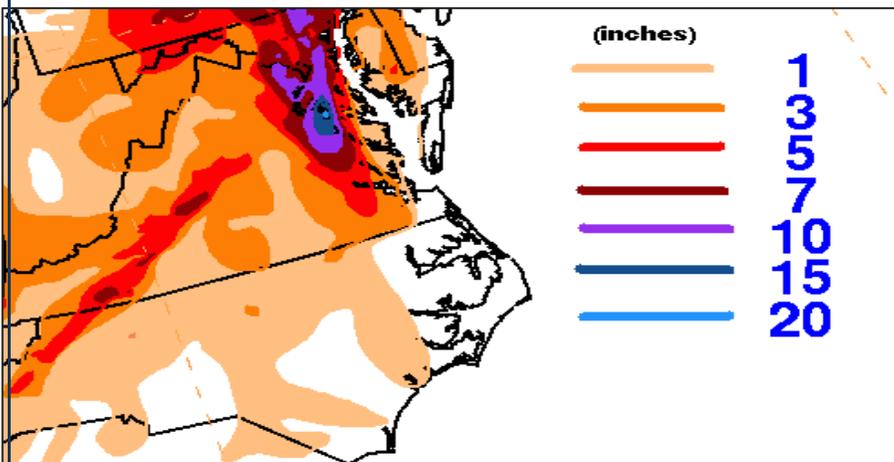


strongest storm was Hurricane Ophelia, a category 4 hurricane with winds of 140 mph which developed in the far eastern Atlantic as a classic Cape Verde type system. Ophelia made about a two week trek through the open Atlantic, staying just north of the Caribbean islands, eventually passing east of Bermuda, before making a direct hit on the Avalon Peninsula in Newfoundland as a much weaker tropical storm.

After a very tranquil period since Hanna's heavy rainfall across the Piedmont in 2008, the local area finally saw some

impact from landfalling tropical systems in 2011. This was primarily due to the passage of Hurricane Irene across eastern North Carolina on August 27<sup>th</sup> and the remnants of Tropical Storm Lee on the 5<sup>th</sup> and 6<sup>th</sup> of September. Although the core of Irene passed well to the east, it's very large wind field spread west into portions of the Piedmont and Foothills resulting in strong enough winds to topple trees, primarily aided by wet ground due to bands of heavy rain on the western fringe of the system.

Lee, despite being a much weaker remnant system after making landfall well to the south along the Gulf Coast, ended up being a very prolific rainfall producing storm as it interacted with a cold front moving through the region. This resulted in widespread 1 to 4 inch rainfall totals with amounts of 7 to 9 inches or more in spots along the Blue Ridge (Fig 2). This rainfall produced mainly minor creek and stream flooding due to rather dry antecedent conditions prior to the event. More importantly, as the remnant circulation of Lee encountered the front, many banded/rotatating supercell type showers and thunderstorms developed which led to the spin up of at least two confirmed tornadoes across parts of the



area. The strongest tornado was an EF1 that impacted locations just west of Traphill in Wilkes County, North Carolina late in the afternoon on September 5<sup>th</sup>. This tornado caused minor damage to three homes and destroyed fourteen outbuildings but without any injuries. A brief EF0 tornado also occurred in Cana in Carroll County, Virginia later that evening resulting in two injuries and significant damage to a local gas station. Other tree and power line damage was also

scattered across the region especially along and just east of the Blue Ridge in both North Carolina as well as southern Virginia.



# NOAA 'Bout Weather



Otherwise the overall trend seen over the past couple of years was again reflected through much of the tropical season with the majority of the tropical storms staying across the open waters of the Atlantic or well south affecting Central America. This was due in part to a large trough of low pressure that persisted off the East Coast for much of the summer which acted to deflect most storms offshore, and strong high pressure over the southern plains that suppressed systems south of the Gulf of Mexico.

However, despite the limited number of landfalls, significant damage along with loss of life occurred with destruction totals estimated to be nearly \$11 billion and fatalities at 118 for the season. Much of this resulted from the passage of Irene through the Caribbean islands where at least 55 deaths were reported. Irene produced additional fatalities in parts of the U.S. and Canada with dollar damages reaching the billions of dollars.

Climatology suggests that an additional tropical system or two could develop through the end of November which marks the official end of the 2011 hurricane season.

## Want to Save Lives? Contact the NWS with your Weather Reports

By Phil Hysell (Warning Coordination Meteorologist)

Tornadoes, hail, damaging winds, flooding, snow and ice, The National Weather Service (NWS) is responsible for issuing warnings for many types of severe weather. We have many tools to help us anticipate and warn for these hazards. However, ground truth reports of actual weather events always have, and always will, be a valuable part of the warning process.

These ground truth reports are disseminated through local media outlets, and motivate citizens in the path of the storm to seek shelter. Many studies have shown that we are much more likely to take action from an

approaching storm if we perceive the threat is real. Imagine a family in the path of a tornado or a line of storms with winds over 60 MPH. If they hear that trees have been blown down or homes have been damaged by high winds downstream, they will be much more likely to move to the basement. Your report of severe weather can potentially save someone's life! It is that important.

To reach us, simply call: 1-866-215-4324.

More information about reporting severe weather to the NWS can be found here:

<http://www.erh.noaa.gov/rnk/SkywarnMainMenu/ToolsMenu/Reporting.htm>

Remember, submitting your eyewitness accounts of significant weather events may be as close as you come to saving someone's life!



# NOAA 'Bout Weather



National Weather Service  
Weather Forecast Office Blacksburg  
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Visit us at [www.weather.gov/blacksburg](http://www.weather.gov/blacksburg)

Questions/Comments? Email [marc.chenard@noaa.gov](mailto:marc.chenard@noaa.gov)